

(12) UK Patent Application (19) GB (11) 2 397 704 (13) A

(43) Date of A Publication 28.07.2004

(21) Application No: 0301307.5

(22) Date of Filing: 21.01.2003

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(51) INT CL⁷:
H02J 7/00 , B25H 3/00

(52) UK CL (Edition W):
H2H HBCA HBCH

(56) Documents Cited:
GB 2171859 A **DE 010132831 A**
US 5148150 A **US 20020008044 A**

(58) Field of Search:
UK CL (Edition V) **H2H**
INT CL⁷ **H02J**
Other: **Online: WPI,EPODOC,JAPIO**

(54) Abstract Title: **Tool case and charger**

(57) A case for one or more battery powered tools includes an integral charger and battery storage points equipped with charging terminals. Additional embodiments describe a charge level indicator and an audible alarm connected to a movement sensor in the case.

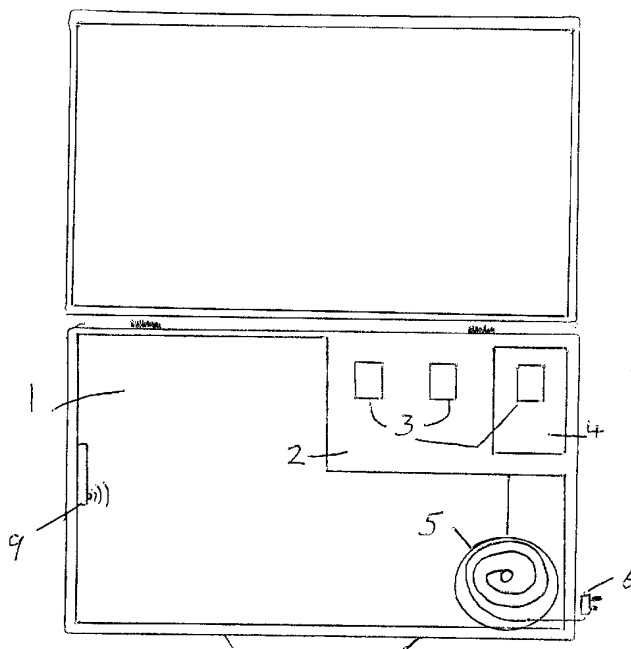


FIG 1

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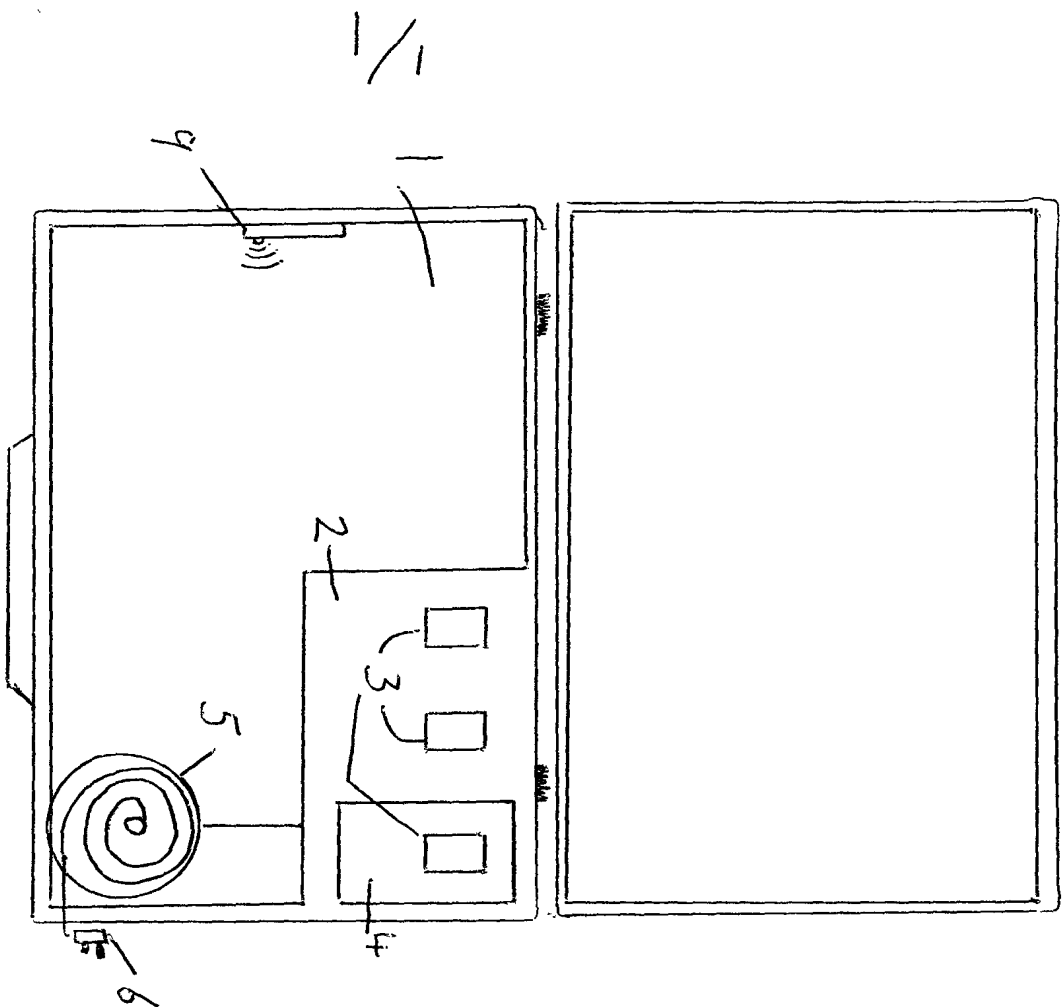


FIG 1

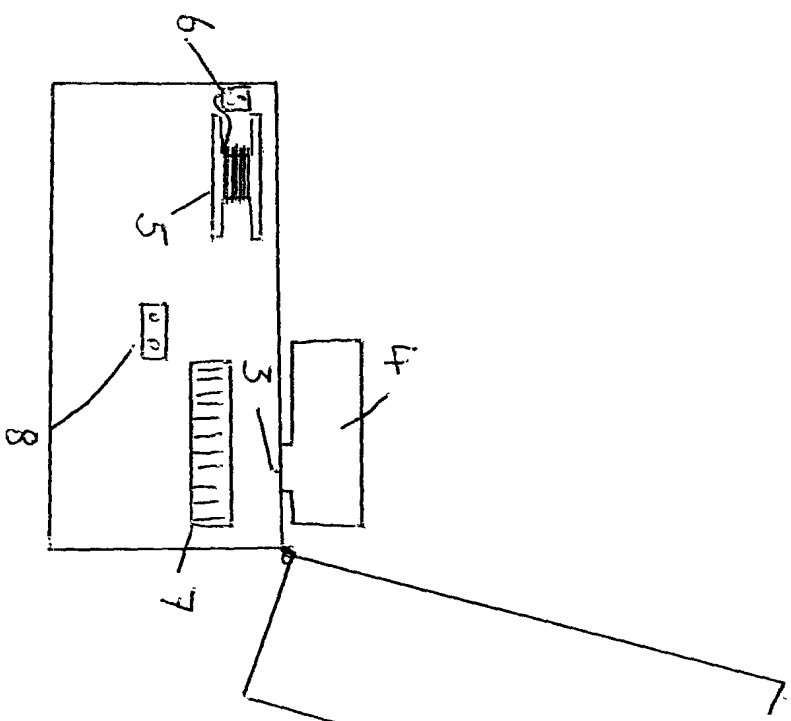


FIG 2

Description:

This invention is concerned with the storage, transportation and recharging of cordless power tools. It is an attempt to simplify and maximise the undoubted convenience of flex free tools.

The convenience of using cordless tools over mains powered units is well known, the one downside to the cordless tool is the requirement for the batteries to be recharged regularly, separate chargers are supplied for this purpose but can become lost or misplaced, batteries need to be independently charged in a separate series of operations, cordless tools are supplied by the manufacturer in carrying cases complete with separated charger.

The objective of this invention is to combine the process of storage with that of charging so that the two may be carried out simultaneously without the requirement for battery unloading and loading before and after charging, thus simplifying use.

A storage case for cordless power tools with the charger supplied as an integrated part of the case structure and not as a stand alone charger, the flex for the charger being housed inside the structure of the case with a pull out and lock and press button retraction system so that the chargers can be powered without the case being opened and operation of uncoiling and recoiling the power flex is simplified as much as possible.

The cases battery storage ports are the docking port (s) of the integrated charger (s) such that the batteries when in the case are always plugged into the charger (s) therefore number of charging/storage ports should correspond to number of batteries in case This arrangement ensures when charger flex plugged in all batteries will be charged simultaneously. This will enable the tool user to simply pull out flex, plug in and switch on and all batteries will start charging ie they will actually plug in storage case rather than charger. The case would contain suitable ventilation to the charger coils to allow for heat dissipation when used in the closed position.

The charge state of the batteries is indicated on the exterior of the case, once charged case is unplugged and the flex retracted into case body.

The storage carry charger unit can have an anti theft device eg. A motion/shock sensor, wired to a siren that sounds if the case is moved/opened without authorisation.

Figure 1 Shows plan view of open case:

Figure 2 Shows Plan view of case side:

The cordless tool case 1 has built into its frame a charging panel 2 which houses a number of charging ports 3 and are powered by battery chargers of known type, the number of ports being determined by the number of batteries supplied with the tool. The charging panel 2 is powered via a mains supplied retractable flex 5 also housed in the frame of the case, the flex is able to retract far enough so that the flex plug 6 is pulled into a position recessed into the side wall of the storage case.

The charging ports 3 double as the batteries 4 normal storage ports such that when in the case the batteries 4 are fitted in the charging ports as per fig 2. The case has ventilation panels 7 to allow heat generated by recharging to dissipate harmlessly when the case is used in the closed position, the condition of the batteries during charging is indicated on a panel 8 visible on the outside of the carrying case, the case can also have anti theft device 9 fitted such that interference with it when armed will result in a siren sounding.

Claims

1. A tool case for one or more cordless (battery operated) tools which has an integrated charger built into the framework of the case such that the charger docking port (s) form the battery storage points for any/all batteries supplied with the tool (s). The charger being powered from an external source of electricity via a retractable flex housed within the body of the storage case.
2. A tool case as per claim one where separate battery storage points are provided.
3. A tool case as per claim 1 & 2 where the number of charger points provided is equal to or greater than one
4. A tool case as per claim 1 to 3 which includes a battery charge state indicator (s) visible when case is closed
5. A tool case as per claim 1 to 4 which includes an audible siren/alarm which can be armed and uses motion sensors, shock sensors/ reed switches or the like to detect unauthorised interference with case. (anti theft device)
6. An tool case and charger substantially as herein described above and illustrated in the accompanying drawings made from plastic, metal, wood or a combination of these materials.



INVENTOR IN PEOPLE

Application No: GB 0301307.5
Claims searched: 1-5

Examiner: Tony Davies
Date of search: 29 September 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X, Y	X: 1-4 Y: 5	GB 2171859 A	(BRISTOL-MYERS) see whole document especially figure 1
X	1-3	US 20020008044 A1	(BURRUS IV ET AL) see whole document especially figure 2
X	1-3	DE 10132831 A	(BOSCH) see abstract and figures
Y	5	US 5148150	(WHITE ET AL) see whole document especially column 2 lines 43-48

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v.

H2H

Worldwide search of patent documents classified in the following areas of the IPC⁷:

H02J; B25H; H01N; A45C; F21S

The following online and other databases have been used in the preparation of this search report:

Online: WPI, EPODOC, JAPIO

PUB-NO: GB002397704A
DOCUMENT-IDENTIFIER: GB 2397704 A
TITLE: Tool case and charger
PUBN-DATE: July 28, 2004

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APPL-NO: GB00301307
APPL-DATE: January 21, 2003

PRIORITY-DATA: GB00301307A (January 21, 2003)

INT-CL (IPC): H02J007/00 , B25H003/00

EUR-CL (EPC): A45C013/24 , B25H003/00 ,
G08B013/06

ABSTRACT:

CHG DATE=20040904 STATUS=O>A case for one or more battery powered tools includes an integral charger and battery storage points equipped with charging terminals. Additional embodiments

describe a charge level indicator and an audible alarm connected to a movement sensor in the case.